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EXAMINER	ART UNIT	PAPER NUMBER
BARND, D	1813	20

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DATE MAILED: 12/12/91

This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

☒ This application has been examined ☐ Responsive to communication filed on _____ ☐ This action is made final.

A shortened statutory period for response to this action is set to expire 3 month(s), 0 days from the date of this letter.
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. ☒ Notice of References Cited by Examiner, PTO-892.
2. ☐ Notice re Patent Drawing, PTO-948.
3. ☐ Notice of Art Cited by Applicant, PTO-1449.
4. ☐ Notice of Informal Patent Application, Form PTO-152
5. ☐ Information on How to Effect Drawing Changes, PTO-1474.
6. ☐ _____

Part II SUMMARY OF ACTION

1. ☒ Claims 1-23, 25, 27, 29-35 are pending in the application.
   Of the above, claims 1-14, 25, 27, 29-35 are withdrawn from consideration.
2. ☒ Claims 24, 26, 28 have been cancelled.
3. ☐ Claims _____ are allowed.
4. ☒ Claims 15-23 are rejected.
5. ☐ Claims _____ are objected to.
6. ☐ Claims _____ are subject to restriction or election requirement.
7. ☐ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.
8. ☐ Formal drawings are required in response to this Office action.
9. ☐ The corrected or substitute drawings have been received on _____. Under 37 C.F.R. 1.84 these drawings are, ☐ acceptable; ☐ not acceptable (see explanation or Notice re Patent Drawing, PTO-948).
10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on _____ has (have) been ☐ approved by the examiner; ☐ disapproved by the examiner (see explanation).
11. ☐ The proposed drawing correction, filed _____ has been ☐ approved; ☐ disapproved (see explanation).
12. ☐ Acknowledgement is made of the claim for priority under U.S.C. 119. The certified copy has ☐ been received ☐ not been received ☐ been filed in parent application, serial no. _____; filed on _____
13. ☐ Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.
14. ☐ Other

EXAMINER'S ACTION

15. Applicant's election without traverse of the invention of Group II (claims 15-23), in Paper No. 19, is acknowledged. Claims 1-14 and 25, 27, and 29-35 are withdrawn from further consideration by the Examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

16. 35 U.S.C. § 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter or any new and useful improvement thereof, may obtain a patent therefore, subject to the conditions and requirements of this title.

17. Claims 15-22 are rejected under 35 U.S.C. § 101 because the invention as disclosed lacks utility. No evidence is provided in the specification that one can immunize an individual against an oncogene or proto-oncogene product by innoculating a tumor-bearing individual with the identical oncogene or proto-oncogene product as that expressed by the individual's tumor. While the applicant demonstrates rejection by a mouse of a tumor expressing the 185 kd neu gene product obtained from a rat, it is not clear that this tumor rejection does not simply result from recognition of xenotypic determinants on the rat neu gene product. The fact that tumor rejection was not observed in a syngeneic system (rats innoculated with tumors expressing the rat neu gene product), coupled with the fact that Padhy et al. were unable to precipitate homologous, cross-reactive proteins from mouse tumors using antibodies to the 185 kd rat protein, further suggests that recognition by mice of xenotypic determinants on the rat protein is the cause of the tumor rejection noted. In this regard, Allen

et al. have shown that mouse T cells which do not recognize as foreign a mouse lysozyme peptide 52-61 (e.g. they are not autoreactive), do recognize as foreign a corresponding lysozyme peptide from a different species (hen) which differs only at a single amino acid at position 56.

In considering the utility of the invention used in a syngeneic system, in the case of oncogenes which do not require a mutation to acquire a transforming ability, it would likely be difficult to elicit an immune response to the oncogene product due to the tolerance which normally exists to self proteins. In the case of oncogenes which require a mutation to acquire transforming ability, while such a mutation may be recognized as foreign in a syngeneic system, because of IR gene effects, a finding that one mouse strain responds to this mutation would not imply that any or all humans would also respond to this same mutation.

18. The following is a quotation of the first paragraph of 35 U.S.C. § 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode comtemplated by the inventor of carrying out his invention.

The specification is objected to under 35 U.S.C. § 112, first paragraph, as failing to provide an adequate written description of the invention and failing to adequately teach how to make and use the invention, i.e. failing to provide an

enabling disclosure. The specification is not enabled for the use of the claimed method in vivo because the utility of the invention has not been proven, for the same reasons outlined in the rejection under 35 U.S.C. 101 above. Further, it is unclear from the specification how one will determine which portions of an oncogene or proto-oncogene product(s) are immunogenic.

19. Claims 15-22 are rejected under 35 U.S.C. 112, first paragraph, for the reasons set forth in the objection to the specification.

20. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this action:

> A person shall be entitled to a patent unless (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

21. The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
>
> Subject matter developed by another person, which qualifies as prior art only under subsection (f) and (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the

time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

22. Claims 15-22 are rejected under 35 U.S.C. 103 as being unpatentable over Lathe et al. in view of Padhy et al., further in view of Yamamoto et al.. Claims 15-22 are drawn to a method of immunizing an individual bearing a tumor which expresses an oncogene or proto-oncogene product with a recombinant pox virus expressing the cellular oncogene or proto-oncogene product. Lathe et al. disclose a method of immunizing a tumor-bearing animal with a recombinant pox virus expressing transformation-specific antigens of polyoma virus, which results in tumor recognition and rejection (see entire document). Lathe et al. does not disclose the use of a recombinant pox virus expressing as the transformation-specific antigen an oncogene or proto-oncogene product. However, Padhy et al. teach a 185 kd tumor antigen specifically induced by transforming DNA (the neu gene) of a rat neuroblastoma which is recognized as foreign by mice, eliciting specific antibody production (see p. 866). In addition, Yamamoto et al. teach that the erb-B gene is the human homologue of the neu gene (see entire document). It would have been prima facie obvious, to a person of ordinary skill in the art, at the time the invention was made, to replace DNA encoding the polyoma virus transformation-specific antigen in a recombinant pox virus vector which elicits specific tumor rejection taught by Lathe et al., with DNA encoding the 185 kd transformation-specific antigen (the neu gene) taught by Padhy et al., or its human homologue, the erb-B gene taught by Yamamoto et al., for the expected result of generating a recombinant pox virus vector potentially able to elicit rejection of tumors caused by oncogenes or proto-oncogenes.

23. Claim 23 is rejected under 35 U.S.C. 103 as being unpatentable over Lathe et al. in view of Padhy et al.. Claim 23 is drawn to a method of producing an oncogene or proto-oncogene product via recombinant pox virus expression. Lathe et al.

disclose recombinant pox virus expression of transformation-specific antigens of polyoma virus which induce an anti-tumor immune response. Lathe et al. does not disclose recombinant pox virus expression of oncogene or proto-oncogene products. However, Padhy et al. teach a 185 kd transformation-specific antigen in rat neuroblastoma which induces an anti-tumor immune response. It would have been prima facie obvious to a person of ordinary skill in the art, at the time the invention was made, to replace the DNA (the neu gene) encoding the transformation-specific antigens of polyoma virus in a recombinant pox virus expression vector taught by Lathe et al. with DNA encoding the 185 kd transformation-specific antigen taught by Padhy et al., for the expected result of enabling inexpensive and reproducible production of large amounts of an antigen able to elicit an anti-tumor immune response, via recombinant pox virus vector expression of transformation-specific DNA (oncogenes).

24. No claims are allowable over the prior art.

25. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103, the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligations under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103.

26. Papers related to this application may be submitted to Group 180 by facsimile transmission. Papers should be faxed to Group 180 via the PTO Fax Center located in Crystal Mall 1. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CM1 Fax Center telephone number is (703) 308-4227.

27. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donna L. Barnd whose telephone number is (703) 308-3908. Any inquiry of a general nature or relating to the status of this application should be directed to the Group 180 receptionist whose telephone number is (703) 308-0196.

December 5, 1991
Donna L. Barnd, Ph.D.

CHRISTINE NUCKER
PRIMARY EXAMINER
ART UNIT 185